

## NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

### WETLAND CREATION

(Ac.)

CODE 658

#### DEFINITION

The creation of a wetland on a site that was historically non-wetland.

#### PURPOSE

To create wetland functions and values.

#### CONDITIONS WHERE PRACTICE APPLIES

This practice applies to sites where no natural wetland occurred historically and contain soils that are not hydric.

**For embankment projects, this practice applies only to areas where the predominant slope is four percent or less.**

This practice does not apply to:

- a constructed wetland (656) intended to treat point and non-point sources of water pollution;
- wetland enhancement (659) intended to rehabilitate a degraded wetland where specific functions and/or values are enhanced beyond original conditions; or
- wetland restoration (657) intended to rehabilitate a degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to approximate original wetland conditions.

#### CRITERIA

##### **General Criteria Applicable to All Purposes**

The purpose, goals and objectives of the creation shall be clearly defined, including the soils, hydrology and vegetation criteria that are

to be met and are appropriate for the site and the project purposes.

The soil, hydrology and vegetative characteristics existing on the site and the contributing watershed shall be documented before the wetland is created.

The impact of this practice on any existing wetland functions and/or values in nearby areas will be evaluated. All federal, State and local requirements shall be addressed.

Where known nutrient and pesticide contamination exists, the species selected will be tolerant of these conditions.

Upon completion, the site shall meet the appropriate wetland criteria and provide wetland functions and values as defined in the project's objectives.

Sites containing hazardous material shall be cleaned prior to the installation of this practice. Soil testing shall be used to determine appropriate actions to clean sites suspected of containing hazardous wastes.

Water rights shall be assured prior to creation.

Disturbance to ground nesting species shall be minimized.

Where offsite drainage or the presence of noxious or invasive plant species impact the site, the design shall compensate for these landscape changes (e.g., increased water depth, berms or microtopography).

Invasive species, federal/state listed noxious plant species, and nuisance species (e.g., those whose presence or overpopulation jeopardize the effectiveness of the practice) shall be controlled on the site. The establishment and/or use of non-native plant

species shall be discouraged, and where possible, controlled.

### **Criteria for Soils**

Created wetlands shall be located in landscape positions and soil types capable of supporting the wetland functions and values.

Loosening of compacted soils, addition of organic matter, or other soil preparation activities, shall be accomplished where necessary to establish desired vegetation.

### **Criteria for Hydrology**

**General Requirements** - The site shall be designed to create hydrologic conditions (including the timing of inflow and outflow, duration, and frequency) that provide the desired wetland functions and values.

The work associated with the wetland shall not adversely affect adjacent properties or other water users unless agreed to by signed written letter, easement or permit.

On sites that have been in long-term agricultural use, grading and shaping can be used as needed to create the diverse micro topography that occurs naturally in wetlands. Engineering structures (impoundments) constructed for wetland creation shall approximate or mimic existing natural topography and micro- and macro-topography.

Water depths for at least ninety percent of the total area below designed normal water elevation will be six feet or less.

**Embankments** – Embankments may be used to impound water and provide wetland hydrology. Refer to the criteria for embankments in the Pennsylvania Conservation Practice Standard for Pond, Code 378. For embankment projects, water depths for at least sixty percent of the total area below the designed normal water elevation will be three feet or less. The overall bottom slope from the six foot water depth to zero will be convex or flat, but not concave.

Timing and level setting of any water control structures installed is required for the establishment of desired hydrologic conditions for management of vegetation and for optimum wildlife and fish use.

Existing drainage systems will be utilized, removed or modified as needed to achieve the intended purpose.

**Surface Drain Plugs** - In areas where open ditches were constructed to provide drainage, wet conditions may be created by constructing surface drain plugs, using a pipe riser or other structures within the ditch to control the water level, or by filling a surface drain to the original ground line. Refer to the criteria for embankments when fill will be placed on the ditch banks.

All fill shall be similar to adjacent soil materials and be compacted to achieve the density of the adjacent materials. Crown the fill a minimum of one foot above the top of the lower existing channel bank to account for settling.

The minimum length of surface drain plugs shall be  $(6H + 4)$  feet. "Minimum length" refers to the length as measured along the top of the plug. "H" is measured from the settled top of the embankment to the low point along the centerline of the embankment (fill).

**Subsurface Drain Plugs** - In areas where subsurface drains were used to lower the water table, remove or plug the drain, or replace the perforated drain with a non-perforated drain to allow the high water table conditions to return.

The minimum length of drain to be removed or plugged shall be as follows:

Length of Drain	Average Hydraulic Conductivity of Soil
50 feet	<0.6 inches/hour
100 feet	0.6 to 2.0 inches/hour
150 feet	>2.0 inches/hour

All envelope filter material or other flow enhancing material shall also be removed for this length. The trench used to alter the drain shall be filled and compacted to achieve a density equal to adjacent natural soil material.

When subsurface drains also function as outlets for other drained areas where drainage is still desired, appropriate measures must be

incorporated to keep the upstream drainage systems functional. A non-perforated pipe shall replace the perforated pipe through the wetland area to be created, and shall extend beyond the wetland in all directions at least the minimum length previously specified for length of drain to be removed or plugged. Drains may also be re-routed around the wetland at the same minimum distances from the wetland, or where topography permits, setting a water control structure at a level that does not affect upstream drainage.

A water control structure may be placed on the inlet of an existing drain. The water control structure shall be attached to a non-perforated conduit that extends at least the minimum length previously specified for length of drain to be removed. The connections of the water control structure and the non-perforated pipe shall be watertight.

**Shallow Excavation** - A wetland may be created by excavating below the existing ground surface to create a shallow basin that will hold surface water and/or intercept groundwater. The basin shall permit storage of water at a depth, frequency, and duration to support the desired plant community and provide other wetland functions.

#### **Criteria for Vegetation**

Establish hydrophytic vegetation typical for the wetland type(s) being established.

Preference shall be given to native wetland plants with localized genetic material.

Where natural colonization of selected species will realistically dominate within 5 years, sites may be left to revegetate naturally. If a site has not become dominated by the targeted species within 5 years, active forms of revegetation may be required.

Adequate substrate material and site preparation necessary for proper establishment of the selected plant species shall be included in the design.

Where planting and/or seeding is necessary, the minimum number of native species to be established shall be based upon the types of vegetative communities present and the vegetation type planned. To achieve habitat diversity and minimize the adverse effects of climate, disease, and other limiting factors,

several species adapted to the site will be established.

Seeding rates shall be based upon percentage of pure live seed to be tested within 6 months of planting.

#### **CONSIDERATIONS**

On sites where woody vegetation will dominate, consider adding 1 or 2 dead snags, tree stumps, or logs per acre, where appropriate, to provide structure and cover for wildlife and a carbon source for food chain support.

The potential for occurrence of threatened or endangered species shall be evaluated for each site proposed for wetland creation.

Consider existing wetland and floodplain functions and/or values that may be adversely impacted.

Consider effect that wetland creation will have on disease vectors such as mosquitoes.

Consider effect of volumes and rates of runoff, infiltration, evaporation and transpiration on the water budget.

Consider effects on downstream flows or aquifers that would affect other water uses or users.

Consider the effect of water control structures on the ability of fish and other aquatic species to move in and out of the wetland.

Consider the impact that water surface drawdown will have by concentrating aquatic species such as turtles into diminished pool areas, resulting in potential mortality. The timing and duration of draw-downs are also important to protect amphibians and reptiles from being exposed during extreme cold temperatures.

NOTE: State permits must be obtained to lower pools of impoundments for activities regulated by other state permits, or for any impoundment larger than one surface acre. Activities requiring draw down may include construction, maintenance or biological manipulation.

Consider timing of water control to mimic the natural hydrological regime of a natural

wetland in the area, further enhancing the habitat for aquatic species.

Consider linking wetlands by corridors of vegetation or habitat wherever appropriate to enhance the wetland's use and colonization by the native flora and fauna.

Consider establishing vegetative buffers on surrounding uplands to reduce sediment and soluble and sediment-attached substance carried by runoff and/or wind.

Consider effects on temperature of water resources to prevent undesired effects on aquatic and wildlife communities.

Soil disturbance associated with the installation of this practice may increase the potential for invasion by unwanted species.

Consider micro-topography, hydrology and hydroperiod when determining which species of vegetation to plant.

Where visual quality would be impacted by structures (e.g., outlet structures, dikes, etc.), consider using low profile structures, natural screening, and or colors that minimize the impact.

Consider controlling water levels to prevent oxidation of organic soils and inundated organic matter and materials.

Consider the effects that location, installation and management may have on subsurface cultural resources.

## PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other documentation. Requirements for the operation and maintenance of the practice shall be incorporated into site specifications. Plans and specifications should be reviewed by staff with appropriate training in design and implementation of wetland creation.

## OPERATION AND MAINTENANCE

The following actions shall be carried out to insure that this practice functions as intended

throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance):

Any use of fertilizers, mechanical treatments, prescribed burning, pesticides and other chemicals to assure the wetland creation function shall not compromise the intended purpose.

Control of undesirable plant species and pests using biological means (e.g., use of predator or parasitic species), or by manipulation of water levels shall be implemented where available and feasible.

Timing and level setting of water control structures is required for the establishment of desired hydrologic conditions, for management of vegetation and for optimum wildlife and fish use.

An inspection schedule shall be established for embankments and structures for damage assessment.

Management actions shall maintain vegetation and control unwanted vegetation, including noxious and invasive species.

The control of water depth and duration may be utilized to control unwanted vegetation.

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